RECEIVED
CENTRAL FAX CENTER
MAR 0 1 2006

MELVIN KRAUS
WILLIAM I. SOLOMON*
GREGORY E. MONTONE
RONALD J. SHORE
DONALD E. STOUT
ALAN E. SCHIAVELLI
PAUL J. SKWIERAWSKI*
ALFRED A. STADNICKI*

DONALD R. ANTONELLI (1935-2005)

*ADMITTED OTHER THAN VA

LAW OFFICES
ANTONELLI, TERRY, STOUT & KRAUS, LLP
SUITE 1800
1300 NORTH SEVENTEENTH STREET
ARLINGTON, VIRGINIA 22209

TELEPHONE (703) 312-6600
FACSIMILE (703) 312-6666
wsolomon@antonelli.com

OF COUNSEL
DAVID T. TERRY
HAROLD A. WILLIAMSON*
JESSICA H. BUI*
LEONID D. THENOR*

STERLING W. CHANDLER*

PATENT AGENT
LARRY N. ANAGNOS

VIA FACSIMILE: 10 PAGES (Including this cover)

TRANSMITTED TO USPTO MAIN FACSIMILE NO. 571-273-8300

MAIL STOP: AF – NO FEE
Commissioner for Patents
P.O. BOX 1450
Alexandria, Virginia 22313-1450

Group AU: **1711**
Examiner: **Patricia Hampton Hightower**
Confirm. No.: **7610**

Re: K. TANAKA, et al. – U.S. Application No. 10/701,440
Atty. Docket No. 396.43260X00

SUBMISSION OF: **REQUEST FOR RECONSIDERATION AFTER FINAL REJECTION (9 PP)**

SIR:

Applicants hereby submit the attached Request for Reconsideration After Final Rejection for entry in the above-identified application.

CERTIFICATE OF TRANSMISSION:

I hereby certify that the attached Request for **Reconsideration After Final Rejection (9 pp.)** is being FORMALLY TRANSMITTED to the USPTO Main Facsimile No. 571-273-8300 on March 1, 2006.

By _____
William I. Solomon

RECEIVED
CENTRAL FAX CENTER 002
MAR 0 1 2006

396.43260X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	K. TANAKA, et al.
Serial No.:	10/701,440
Filed:	November 6, 2003
Title:	PRODUCTION METHOD OF POLYAMIDE
Group AU:	1711
Examiner:	Patricia Hampton Hightower
Confirmation No.:	7610

REQUEST FOR RECONSIDERATION AFTER FINAL REJECTION

Mail Stop: AF
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

March 1, 2006

SIR:

In response to the Final Office Action mailed December 1, 2005, Applicants respectfully submit the following Remarks traversing the Finality of this Office Action mailed December 1, 2005, and also traversing the new rejection of claims 1–28 under 35 U.S.C. 102 as anticipated by the teachings of Tanaka, U.S. Patent No. 6,303,741.

As will be shown in the following, it is respectfully submitted that in view of the new grounds of rejection of claims 1–28 under 35 U.S.C. 102, with various of the previously considered claims, including independent claim 16 and claims 17–28 ultimately dependent thereon, not having been amended in the Amendment filed September 9, 2005, clearly the Finality of the Office Action mailed December 1, 2005, is improper. Moreover, as will also be shown in the following, it is respectfully submitted that the teachings of Tanaka would have neither disclosed nor would have suggested the subject matter of the present claims, including developing estimating

equations and use of such equations, and in particular wherein such development of estimating equations is performed in connection with melt polymerization.

Initially, Applicants respectfully traverse the Finality of the Office Action mailed December 1, 2005. In this regard, note that in the prior Office Action mailed June 9, 2005, there was no rejection under 35 U.S.C, 102/103, all claims being rejected under the judicially created doctrine of obviousness-type double patenting over claims 1 – 18 of U.S. Patent No. 6,303,741. In the Amendment submitted September 9, 2005, claim 1 was in substance amended addressing a rejection of claims under the second paragraph of 35 U.S.C. 112 in the Office Action mailed June 9, 2005; and independent claim 16 (and claims dependent thereon) were not amended. Notwithstanding that claims 16 – 28 were not amended in the Amendment filed September 9, 2005, in the Office Action mailed December 1, 2005, the Examiner withdrew the obviousness-type double patenting rejection, and applied a new ground of rejection, under 35 U.S.C. 102, of all claims in the application (including unamended claims 16-28), applying the same patent previously applied in the obviousness-type double patenting rejection. It is respectfully submitted that in view of the new ground of rejection, especially with respect to unamended claims, the Office Action cannot properly be made a Final rejection. See Manual of Patent Examining Procedure 706.07(a).

On page 3 of the Office Action mailed December 1, 2005, the Examiner has indicated that the Office Action is made Final, yet provides no basis for the propriety of the Finality of the Office Action (for example, that Applicants' amendments made in the Amendment filed September 9, 2005, necessitated the new ground of rejection). Clearly, Finality of the Office Action mailed December 1, 2005, is

improper, and the Examiner is respectfully requested to reconsider and withdraw such Finality.

In any event, it is respectfully requested that the present Request for Reconsideration, addressing the rejection of claims in the above-identified application on the merits, be entered and fully considered by the Examiner in response to the Office Action mailed December 1, 2005.

Applicants respectfully traverse the rejection of all of their claims in the Office Action mailed December 1, 2005, as anticipated by the teachings of U.S. Patent No. 6,303,741 to Tanaka, and respectfully submit that all of the claims in the above-identified application patentably distinguish over the teachings of Tanaka, under the provisions of 35 U.S.C. 102 and 103.

It is respectfully submitted that the teachings of the applied reference would have neither taught nor would have suggested such a production method of polyamide by batch melt polymerization as in various of the present claims, including, inter alia, developing at least one estimating equation for calculating a mole balance, a molecular weight of polyamide, and a relative viscosity of polyamide, under melt polymerization from a melt viscosity of polyamide measured at a set point during the melt polymerization; providing an estimation, using this at least one estimating equation, of at least one property selected from the group consisting of mole balance, molecular weight and relative viscosity of polyamide under melt polymerization from the melt viscosity; and continuing the melt polymerization in the next and subsequent batches under conditions determined by results of the estimation. See claim 1.

In addition, it is respectfully submitted that the applied reference would have neither taught nor would have suggested such a production method of polyamide by

solid phase polymerization of batch melt-polymerized polyamide, as in various of the present claims, including, inter alia, (i) developing estimating equations for calculating a mole balance of polyamide under melt polymerization and for calculating a molecular weight or relative viscosity of polyamide, from the melt viscosity of polyamide measured at a set point during the melt polymerization, and (ii) calculating a mole balance, and molecular weight or relevant viscosity, respectively (a) at the set point during the melt polymerization of next and subsequent batches from the estimating equation and (b) at an end point of the melt polymerization of next and subsequent batches, from the estimating equations; with conditions of the solid phase polymerization of the melt-polymerized polyamide being determined on the basis of the calculated values calculated from the estimating equations. See claim 16.

As well be discussed further infra, the present invention addresses the melt polymerization and develops estimating equations and calculates values therefrom, utilized in, for example, subsequent melt polymerization or subsequent solid phase polymerization. Tanaka, on the other hand, while generally disclosing use of melt polymerization prior to solid phase polymerization in forming polyamide, does not address specifics of the melt polymerization, and would have neither taught nor would have suggested the development of estimating equations of various values of polyamide under melt polymerization and calculating various values therefrom, for use in subsequent melt polymerization and/or subsequent solid-phase polymerization, as in the present invention, and advantages thereof.

In addition, it is respectfully submitted that the teachings of the applied reference would have neither taught nor would have suggested the other features of the present invention as in the dependent claims, each of which individually provide

additional advantages for the present invention and provide additional bases for patentability of the presently claimed subject matter.

The present invention relates to a production method of polyamide, utilizing melt polymerization in a batch polymerization procedure, which can be used wherein polymerization is performed solely by melt polymerization or wherein the batch melt-polymerized polyamide is subjected to a further, solid phase polymerization. In the present method properties of the batch melt polymerized polyamide are estimated and used in connection with further processing.

Generally, a melt-polymerized polyamide is produced by dehydrating polycondensation of a diamine monomer and a dicarboxylic acid monomer, in which the monomers are melt-polymerized at reaction temperatures higher than the melting point of the polyamide being produced. In the production of polyamide, it is important to maintain the preset mole balance and the preset polymerization conditions to ensure production of polyamide with uniform and stable quality. Therefore, various methods have been employed to maintain such preset values. However, previously proposed techniques generally take a significantly large amount of time or require expensive equipment, and thus have been unsatisfactory.

Recently, on-line measurement of polymer properties using a near infrared spectrometer has been proposed. However, as described on pages 3–7 of Applicants' specification, such proposed techniques have been unsatisfactory, requiring, e.g., an undue amount of time before results are obtained, which requires, disadvantageously, storage of melt-polymerized polyamide before further processing (for example, before subsequent solid phase processing).

Against this background, Applicants provide techniques in which a rapid and simple estimation of properties (e.g., mole balance) can be obtained during the melt

polymerization. Thus, according to the present invention, an estimation of properties can easily and quickly be made and utilized during further polymerization of the polyamide (e.g., by melt or solid-phase polymerization, or subsequent treatment of a new batch by melt polymerization).

As a result of extensive study, the inventors have found that, in the production of polyamide by batch melt polymerization, the mole balance of the polyamide under melt polymerization can be calculated from the melt viscosity of the polyamide under melt polymerization. The inventors have further found that the mole balance, molecular weight and relative viscosity of the polyamide can be calculated from the melt viscosity of the polyamide under melt polymerization, and that the melt-polymerized polyamide is efficiently solid-phase polymerized by calculating the conditions of the solid phase polymerization from the calculated values in connection with the melt polymerization. The inventors still further have found that, in the production of polyamide by batch melt polymerization, the melt viscosity, molecular weight and relative viscosity of the polyamide under melt polymerization can be calculated from the stirring torque of polyamide during the melt polymerization.

Having made these findings, Applicants have achieved the present invention. That is, according to an aspect of the present invention, Applicants develop at least one estimating equation, and provide an estimation of at least one property selected from the group consisting of mole balance, molecular weight and a relative viscosity, using this at least one estimating equation; the melt polymerization is continued in, e.g., next and subsequent batches, under conditions determined by results of the estimation. See claim 1.

According to another aspect of the present invention, estimating equations are developed respectively for calculating a mole balance, and for calculating a

molecular weight or relative viscosity, of polyamide under melt polymerization from a melt viscosity of polyamide measured at a set point during the melt polymerization, with a mole balance at the set point, and a molecular weight or relative viscosity at an end point of the melt polymerization, being calculated using such equations; and conditions of the solid phase polymerization of the melt-polymerized polyamide are determined on the basis of the aforementioned calculated values.

Thus, according to the techniques of the present invention, mole balance, molecular weight and relative viscosity of polyamides under melt polymerization can be rapidly estimated from the measured value of melt viscosity; and, since the mole balance, molecular weight and relative viscosity can be easily obtained in real time, subsequent production conditions can be easily controlled and the production results of a batch can be rapidly reflected in the next and subsequent batches. Moreover, by estimating melt viscosity from stirring torque, mole balance, molecular weight and relative viscosity can be easily estimated without needing expensive measuring equipment, and such properties can be easily and rapidly estimated so that further processing can be performed without delay and subsequent treatments can be easily controlled. As for advantages according to the present invention, note, for example, from page 35, line 11 through page 36, line 6, of Applicants' Specification.

Tanaka discloses a solid phase-polymerized polyamide suitable for various applications such as bottles, sheets, films, fibers or the like. This patent discloses that the solid phase-polymerized polyamide is produced by solid phase polymerization of a melt-polymerized polyamide obtained by polycondensing in molten state a diamine component containing not less 80 mol % of m-xylylenediamine with a dicarboxylic acid component containing not less than

80 mol% of adipic acid, with the melt-polymerized polyamide satisfying specified formulae, and with the solid phase-polymerized polyamide satisfying specified formulae. Note, for example, column 5, line 59 through column 6, line 19. See also column 6, line 20–63, for a second aspect of the invention disclosed in Tanaka. Note also column 7, lines 7–11 and 51–58; column 8, lines 11–17, 42–44 and 51–59; and column 9, lines 27–31, for further disclosure in connection with the melt polymerization.

As seen in the foregoing, as well as from a full review of Tanaka, this patent is primarily concerned with the solid-phase polymerization procedure, at most only generally disclosing the melt polymerization. In particular, it is respectfully submitted that Tanaka is silent about details of process parameters for the melt polymerization. It is respectfully submitted that this reference would have neither taught nor would have suggested the presently claimed subject matter, including the development of estimating equations of polyamide under melt polymerization, from a melt viscosity of polyamide measured, e.g., at a set point during the melt polymerization, and use of such estimating equations as in the present claims, either in continuing the melt polymerization or in determining conditions of solid phase polymerization of the melt-polymerized polyamide; and other features of the present invention as in the dependent claims, and advantages of all features of the present invention.

In the Office Action mailed December 1, 2005, the Examiner, in the paragraph bridging pages 2 and 3 thereof, discusses the teachings of Tanaka, including that Tanaka discloses a solid phase-polymerized medium–to-high viscosity polyamide containing gels or fish eyes in small amounts, and points out various features of the solid phase-polymerized polyamide. Clearly, Tanaka would have neither taught nor would have suggested the development of estimating equations of polyamide under

melt polymerization from a melt viscosity of polyamide measured, e.g., at a set point during the melt polymerization, and use of these estimating equations as in the present claims, and advantages thereof.

In view of the foregoing comments and amendments, reconsideration and withdrawal of the Finality of the Office Action mailed December 1, 2005, and reconsideration and allowance of all claims presently in the above-identified application, are respectfully requested. In any event, reconsideration and allowance of all claims presently pending in the above-identified application are respectfully requested.

Applicants request any shortage of fees due in connection with the filing of this paper be charged to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (case 396.43260X00), and credit any excess payment of fees to such Deposit Account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

By _____
William I. Solomon
Registration No. 28,565

WIS/gjb/ksh
1300 N. Seventeenth Street
Suite 1800
Arlington, Virginia 22209
Tel: 703-312-6600
Fax: 703-312-6666